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REPLY BRIEF

Applicant : Denney et al.
App. No : 10/690,833
Filed : October 22, 2003
For : LASER HEAD FOR IRRADIATION
AND REMOVAL OF MATERIAL
FROM A SURFACE OF A
STRUCTURE
Examiner : Elve, Maria Alexandra
Art Unit : 1793

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Bruce S. Itchkawitz, Reg. No. 47,677

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicants (Appellants) hereby reply to the Examiner's Answer to Appellants' Appeal Brief. The Examiner's Answer was dated July 11, 2008, so pursuant to 37 C.F.R. § 41.41, the two-month deadline for filing this reply brief is Thursday, September 11, 2008. Appellants note that the Examiner's Answer does not include any new grounds of rejection.

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I. STATUS OF CLAIMS

Claims 1-22 are currently pending in the application. All of the pending claims were finally rejected by the Examiner in the Final Office Action mailed January 11, 2008. Rejected Claims 1-22, as they stand rejected in the January 11, 2008 Final Office Action, are the subject of this appeal.

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II. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether Claims 1-22 are unpatentable under 35 U.S.C. § 103(a) over U.S. Patent No. 5,977,515 issued to Uraki et al. ("Uraki") in view of U.S. Patent No. 6,507,000 issued to Otsubo et al. ("Otsubo"), U.S. Patent No. 6,693,255 issued to Freiwald ("Freiwald"), and U.S. Patent No. 3,369,101 issued to DiCurcio ("DiCurcio").

III. ARGUMENT

Claims 1-22 Are Not Obvious in View of Uraki, Otsubo, Freiwald, and DiCurcio

In the Appeal Brief, Appellants respectfully submitted that the Examiner failed to establish a *prima facie* case of obviousness as required by 35 U.S.C. § 103(a). Appellants argued that the cited combination of references does not disclose or suggest all the features of the claimed invention. Furthermore, Appellants argued that the cited combination of references did not provide a reasonable expectation of success, and that the Examiner has not articulated a reason to modify or combine the cited references so as to make the claimed invention obvious. In the discussion below, Appellants respond to various points raised by the Examiner in the Examiner's Answer in response to the Appeal Brief. In addition, the arguments presented in the Appeal Brief are incorporated in their entirety by reference herein.

The Combination Of Uraki, Otsubo, Freiwald, And DiCurcio Does Not Disclose or Suggest All The Features Recited By Claims 1-22

In re Keller and In re Merck

In the Appeal Brief, Appellants discussed each of the cited references and explained that none of the cited references discloses or suggests "a containment plenum ... cooled by a cooling medium flowing through a coolant conduit of the containment plenum," as recited by Claim 1, so this feature of Claim 1 cannot be considered to be taught or suggested by the combination of the cited references. Similarly, Appellants explained that none of the cited references discloses or suggests a "confining means ... cooled by a coolant medium flowing through a cooling conduit of the confining means" as recited by Claim 19, so this feature of Claim 19 cannot be considered to be taught or suggested by the combination of the cited references.

In response, the Examiner repeatedly cited *In re Keller*, 642 F.2d 413, 208 U.S.P.Q. 871 (C.C.P.A. 1981) and *In re Merck & Co.*, 800 F.2d 1091, 231 U.S.P.Q. 375 (Fed. Cir. 1986) for the proposition that "one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references." However, Appellants submit that

neither of these cases is instructive for the present case in which the claimed invention recites features which are not taught or suggested by any of the cited references.

In *Keller*, the claimed invention was a heart pacer apparatus having a digital timer. The primary reference disclosed the claimed structure except it had an analog timer rather than a digital timer. The secondary reference disclosed that in an analogous environment, digital timers are more accurate than analog timers. The appellant of *Keller* argued against the obviousness rejection by asserting that the secondary reference did not disclose a digital timer in a heart pacer apparatus. The court rejected this argument as an improper attack solely on the single secondary reference where the obviousness rejection was based on the combination of the primary and secondary references.

In *Merck*, the claimed invention was a method of treating depression comprising orally administering amitriptyline to a patient. The cited references disclosed that (i) the properties of amitriptyline included a “manifold activity upon the central nervous system,” (ii) imipramine is structurally related to amitriptyline, differing only by an isoteric replacement, (iii) imipramine is an effective antidepressant, (iv) compounds differing only by an isoteric replacement often result in similar biological activity, and (v) both amitriptyline and imipramine have activity as tranquilizers. The appellant of *Merck* argued against the obviousness rejection by asserting that one secondary reference taught away from the claimed invention. The court rejected this argument as an improper attack solely on the secondary reference where the obviousness rejection was based on the combination of all the cited references.

In contrast to both *Keller* and *Merck*, in the Appeal Brief of the present case, Appellants have explained how each of Claims 1-22 recites at least one feature which is not disclosed or suggested by any of the cited references or by the combination of the cited references. Thus, the Examiner’s reliance on *Keller* and *Merck* is not proper in the present case.

Appellants reassert that when considered together, the combination of the Uraki, Otsubo, Friewald, and DiCurcio references does not disclose or suggest all the features of the claimed invention recited by Claim 1 (*e.g.*, “a containment plenum ... cooled by a cooling medium flowing through a coolant conduit”) or by Claim 19 (*e.g.*, “a confining means ... cooled by a coolant medium flowing through a cooling conduit of the confining means”). The combination

of these cited references, including (i) the plenum of Uraki, (ii) the dust collector of Otsubo, (iii) the flowing ambient air which cools the ablated material of Friewald, and (iv) the cooling conduit which cools the flash lamp and laser rod of DiCurcio, does not disclose or suggest a containment plenum or a containment means cooled by a cooling medium flowing through a coolant conduit. Not only are these features of Claims 1 and 19 missing from each of the cited references, but they are also missing from the combination of these cited references. Therefore, Appellants submit that the asserted combination of references does not collectively teach or suggest the claimed invention of the present application.

Inherency

Appellants submit that the Examiner is improperly relying on inherency for teachings of various features of the claimed invention. For example, in the Examiner's Answer at page 8, lines 3-11, the Examiner asserts that (emphasis added):

It is the examiner's position that it is well known that flowing medium is generally used for cooling. Uraki et al. teaches a flowing medium and inherently teaches a cooling medium. Secondly Uraki et al. discloses an injection mechanism but does not specifically describe the mechanism. It is the examiner's position that an injection mechanism would most likely include the use of a pipe, tube or conduit. Thus the conduit although not explicitly recited is inherently taught by Uraki et al. Third, the plenum (compartment 3) and associated structure is underwater, hence the system is inherently passively cooled by the outside body of water.

In this passage, the Examiner asserts that since flowing medium is "generally used" for cooling and Uraki discloses a flowing medium, Uraki inherently discloses a cooling medium. In addition, the Examiner asserts that since in the examiner's opinion, the injection mechanism of Uraki "would most likely include" a conduit, Uraki inherently discloses a conduit. Furthermore, the Examiner asserts that because the plenum of Uraki is underwater, it is "inherently passively cooled" by the outside body of water. Other portions of the Examiner's Answer repeat these assertions of inherency (*see, e.g.*, page 14, lines 17-22; page 16, lines 8-10; page 17, lines 7-16). In particular, at page 17, lines 14-16 of the Examiner's Answer, the Examiner states that "Uraki et al. ... inherently teaches a cooling of the plenum (compartment 3)."

Applicants submit that this reasoning is a misapplication of the concept of inherency. Pursuant to M.P.E.P. § 2112(IV) (Rev. 6, September 2007, page 2100-47), "[t]he fact that a

certain result or characteristic may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristic” (emphasis in original; citing *In re Rijckaert*, 9 F.3d 1531, 1534, 28 U.S.P.Q.2d 1955, 1957 (Fed. Cir. 1993); *In re Oelrich*, 666 F.2d 578, 581-82, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981)). The mere fact that a certain thing may result from a given set of circumstances is not sufficient. “Inherency may not be established by probabilities or possibilities.” *In re Robertson*, 169 F.3d 743, 745, 49 U.S.P.Q.2d 1949, 1950-51 (Fed. Cir. 1999). To establish inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the prior art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)(emphasis in original).

While Uraki discloses a system which can include monitoring of the flow rate, the pressure, the moisture level, and the temperature of the dry gas atmosphere within the compartment (*see, e.g.*, Uraki, col. 12, lines 44-55), Uraki does not disclose whether the injected gas is colder or hotter than the compartment. Considering that Uraki discloses injecting gas to expel water from within the compartment, it is entirely possible that the temperature monitoring disclosed by Uraki is monitoring an *increase* in temperature, not cooling, of the dry gas atmosphere within the compartment. Therefore, even if the Examiner is correct in stating that “flowing medium is generally used for cooling,” the flowing medium of Uraki cannot be relied upon for an inherent disclosure of a cooling medium since it is not necessarily true that the injected gas cools the compartment.

Similarly, although Uraki discloses that the compartment is underwater (*e.g.*, within the pressure vessel of a nuclear reactor, *see* Uraki at col. 1, lines 13-24), Uraki is silent regarding the relative temperatures of the compartment and the surrounding water. It is possible that the surrounding water temperature is higher than that of the compartment (*e.g.*, heated by the radiation disclosed by Uraki). Thus, contrary to the Examiner’s assertion, the compartment is not “inherently passively cooled” by the surrounding water since it is not necessarily true that the surrounding water cools the compartment. Therefore, to the extent that the rejections of Claims 1-22 rely on the purported inherent teachings of Uraki, Appellants respectfully submit that these rejections are improper.

Cooling of the laser-processed material

In the Examiner's Answer, the Examiner repeatably asserts that Freiwald is relied upon for the teaching of cooling of laser processed (ablated) materials (*see, e.g.*, page 11, lines 8-26; page 13, line 21 – page 14, line 1; page 15, lines 7-8; page 17, lines 21-22; page 18, lines 10-11). For example, the Examiner at page 18, lines 7-11 states that (emphasis in original):

The claims are rejected over Uraki et al. in view of Otsubo et al., Freiwald et al. and DiCurcio et al. Uraki et al., the primary reference, teaches the main laser apparatus, plenum, flowing medium and so forth. DiCurcio et al. is used to teach a CONDUIT [sic], while Otsubo et al. teaches a CONTAINMENT plenum and Freiwald et al. teaches COOLING of laser processed material.

The Examiner does not explain how this teaching of Friewald in combination with the teachings of the other cited references equates to “a containment plenum ... cooled by a cooling medium flowing through a cooling conduit of the containment plenum,” as recited by Claim 1. Presumably, the Examiner is relying on the teaching of cooling of laser processed materials by Freiwald as implicitly also cooling the plenum. However, Appellants submit that this implication is not proper, and that cooling of the laser processed materials does not equate to cooling of the plenum.

Freiwald discloses a cleaning head having a flow assembly in proximity to the surface being irradiated. The flow assembly allows ambient air from outside the cleaning head to flow through the nozzle and to cool the ablated material (Freiwald, col. 5, lines 40-43). However, Freiwald does not disclose or suggest that this flowing ambient air cools anything except the laser processed materials (*e.g.*, dust, gas, debris, contamination). In particular, Freiwald does not disclose or suggest the relative temperatures of the flowing ambient air or the cleaning head, and does not disclose or suggest anything indicating that the ambient air inherently cools the cleaning head. Therefore, Appellants submit that the combination of cited references does not disclose or suggest all the features of Claims 1-22.

It Would Not Be Obvious To Combine Uraki, Otsubo, Freiwald, And DiCurcio

“Common sense”

In the Appeal Brief, Appellants argue that none of the cited references disclose that the containment plenum is exposed to sufficient heat to warrant cooling using cooling conduits, and

that such knowledge was not known within the level of ordinary skill at the time the claimed invention was made, so persons skilled in the art would not expect such cooling to be useful. As explained by Appellants at page 8, line 23 – page 9, line 3, none of the systems disclosed by Uraki, Otsubo, and Freiwald expose a containment plenum to sufficient heat to require cooling using cooling conduits, so there is no motivation for persons skilled in the art to modify their teachings using the teaching of DiCurcio.

At page 18, lines 17-20 of the Examiner's Answer, the Examiner responds to this argument by stating that:[t]he examiner respectfully disagrees and takes the position that from a common sense perspective; generally speaking, most machining operations require some form of cooling. Thus it would be within the level of ordinary skill at the time of the invention to use cooling during laser machining.

Appellants traverse this characterization of "common sense" as expressed by the Examiner.

Standard machining operations utilize a solid cutting element in contact with and moved relative to a solid workpiece being machined. Friction between the solid cutting element and the solid workpiece can create heat which can be counteracted by cooling the cutting element, the workpiece, or both. Thus, it may be common sense that such standard machining operations may use some form of cooling as stated by the Examiner.

However, Appellants submit that not all machining operations require cooling, and certainly all machining operations do not require cooling by a cooling medium flowing through a cooling conduit. In particular, laser machining systems (*e.g.*, as disclosed by the present application) which do not create friction between a cutting element and the workpiece are not expected by persons skilled in the art to benefit from cooling of a portion of the system in proximity to the workpiece. For example, as explained by Appellants in the Appeal Brief at page 8, line 23 – page 9, line 3, none of the cited references (Uraki, Otsubo, Freiwald, or DiCurcio) disclose or suggest that the interaction of the laser with the workpiece creates sufficient heat to warrant cooling of the containment plenum using a cooling medium flowing through a coolant conduit of the containment plenum. Therefore, contrary to the Examiner's assertion, it is not "common sense" that the prior art laser machining systems would require some form of cooling.

No expectation of success / unsatisfactory for its intended purpose

Appellants argued in the Appeal Brief at page 9, line 12 – page 10, line 8 that it would not be obvious to persons skilled in the art to combine the teachings of Uraki, Otsubo, and Freiwald since doing so would yield no expectation of success and would render the modified prior art unsatisfactory for its intended purpose. Appellants explained that both Otsubo and Freiwald disclose the requirement that the head be spaced away from the workpiece to allow ambient air to enter the nozzle (Freiwald at col. 5, lines 40-44) and to allow free movement of the workpiece (Otsubo at col. 3, lines 42-43). Appellants further explained that (i) making such a modification would prevent operation of the disclosed system of Uraki, and (ii) modifying either Otsubo or Freiwald to be pressed tightly against the workpiece, as disclosed by Uraki, would also remove the required ambient air or the required freedom of movement of these disclosed systems.

On page 19, lines 16-17 of the Examiner's Answer, the Examiner disagrees because "distances and gaps are not limitations in appellant's claims." Appellants submit that the Examiner's response misses the point and that Appellants have not argued that the specific distances and gaps are recited by the claims. For a *prima facie* case of obviousness, there must be a reasonable expectation that the beneficial result will be achieved. *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986); see also M.P.E.P. § 2143.02. Furthermore, if the modified system would be unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. M.P.E.P. § 2143.01(V). Appellants submit that the combination of references proposed by the Examiner does not have a reasonable expectation of success and would be unsatisfactory for its intended purpose.

According to the Examiner's Answer at page 18, lines 7-11, the Examiner has cited Otsubo for the teaching of a containment plenum and has cited Freiwald for the teaching of cooling of laser processed materials. Otsubo discloses that the containment plenum must have a gap between it and the workpiece (Otsubo at col. 2, lines 57-58) and Freiwald discloses that the laser processed material is cooled by ambient air which enters the nozzle (Freiwald at col. 5, lines 40-44). Therefore, if the system disclosed by Uraki were to be modified to use the containment plenum disclosed by Otsubo and the cooling of laser processed materials as disclosed by Freiwald, the system would no longer work since water would flood the interior of

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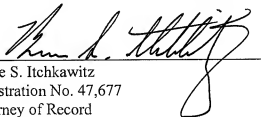
the containment plenum. Thus, the proposed combination of references does not have a reasonable expectation of success, and the modified Uraki system would be unsatisfactory for its intended purpose (underwater laser processing). Persons of ordinary skill in the art would not have been motivated to combine the underwater laser processing system of Uraki with the containment plenum of Otsubo and the cooling of laser processed materials of Freiwald, since this combination of the references would have led to a non-functional system.

Conclusion

In view of the foregoing, Appellants respectfully submit that the rejections of Claims 1-22 are not well founded. Appellants therefore respectfully request that the Board reverse the rejection of Claims 1-22.

Respectfully submitted,

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